KNG Editor Help

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TUNING HELP UNDER CONSTRUCTION

1 Overview

KNG Editor is the PC Programming Software for BK Radio's KNG APCO Project 25 digital portable radio. To meet backwards compatibility as defined by the APCO Project 25 standard, the KNG provides users the ability to interoperate with narrow or wide band analog channels as well as digital systems.

Select Radio Type
The KNG Programming Software is designed to program multiple model types.Use the dropbox to select the model type of the radios you will be programming.

Model Types

P150	Portable VHF
P400	Portable UHF - Low
P500	Portable UHF - High
P800	Portable 800 MHz
M150	Mobile VHF
M400	Mobile UHF - Low
M500	Mobile UHF - High
M800	Mobile 800 MHz

Channel Zones
Radio channels can be separated into zones. Each zone of channels has its own Channel Screen and Zone Settings Screen.

Security

Enable Clear Tx Mode Warning Beep
If checked, the radio emits an audible tone with each Push-to-Talk when encryption is disabled.
If unchecked, no warning tone is heard prior to unencrypted transmissions.

OTAR
Radios that have the factory option support Over-the-Air Rekeying of encryption keys (OTAR).

If checked, Over-the-Air Rekeying is enabled.
If uncheck, Over-the-Air Rekeying is disabled.

Mark the OTAR channel(s) that will communicate with the Key Management Facility (KMF) in the Channels Screen.

When the radio is operating in Channel Scan, Priority Scan, and Zone Scan, the main zones's OTAR Scan Option Channel is used for the OTAR channel. If the OTAR Scan Option Channel is set to "None", OTAR will be disabled when any scan mode is enabled.

4 Tuning

TUNING HELP UNDER CONSTRUCTION

TX Power

TUNING HELP UNDER CONSTRUCTION

Channel Screen
The Channel Screen allows editing of each channel's Frequencies, Operating Modes, Channel Guards, Network Access Codes (NAC), P25 Squelch Operation, Talk Group ID, Bandwidth (BW) Low Power lock (LP) and security selections. Each channel can also be added to or deleted from the zone's scan list (SCN). To access a Channel Screen, click on one of the Zone folders in the leftmost panel.

Zone Settings Screen
The Zone Settings Screen allows editing of data that is specific to each Channel Zone, such as the Zone Label, Priority Channels, etc. To access a Zone Settings Screen, click on the '+' sign next to a Zone folder, then click on the Settings folder.

Encryption Tab

Radios with digital encryption options can hold up to 32 DES or AES encryption keys. Each channel is assigned a default Key for transmit. The key can be locked to the channel, or if programming allows, a transmit key other than the default key can be selected from the radio's Key Pick List. If a key is selected from the pick list, it will be used during transmit on every channel that allows selectable keys.

A KVL 3000 Plus Keyloader (Available from Motorola) and Keyload Interface Cable are required to program encryption keys to the KNG.

SLN
Enter SLN's (Storage Location Numbers) in the table that correspond to the CKR's (Common Key References) of the keys that have been loaded into the radio with an APCO Project 25 compatible keyloader unit.

Label
Program an alphanumeric label for each active encryption key.

Global Settings Screen
The Global Settings Screen allows editing of data that will be used by ALL Channel Zones in the radio, such as the radio's P25 Unit ID, Talkback Modes, and Soft Switch assignments. To access the Global Settings Screen, click on Global Settings in the leftmost panel.

Writing Data to Radio
To write ALL data to the radio, click on the Write button.

To write selected data to the radio, from the menu bar select "Write" to pull down the Write Menu.

Write ALL Data to Radio

Write Global Information to Radio

Write Active Group Information to Radio

Reading Data from Radio
To read ALL data from the radio, click on the Read button.

To read selected data from the radio, from the menu bar select 'Read' to pull down the Read Menu.

Read ALL Data from Radio

Read Global Information from Radio

Read Active Group Channels and Settings

2 Channel & Zone Settings

Channel Settings

| | Hexadecimal | Decimal |

Hexadecimal   **Decimal**

User Tx NAC Picklist

1	$FFF	17	$293
2	$293	18	$293
3	$293	19	$293
4	$293	20	$293
5	$293	21	$293

User Tx NAC Picklist

1	4095	17	0659
2	0659	18	0659
3	0659	19	0659
4	0659	20	0659
5	0659	21	0659

To assign a UNAC for use on a channel, the transmit NAC must be set to UNAC EN or UTXG xx, where "xx" = NAC. (See Transmit NAC)

User Talk Group

To program the UTGID Pick List with this editor, click on the Global Settings icon on the left-most panel, then select the Pick Lists. Enter up to 32 TGIDs.

User Talk Group ID Picklist

1	1	17	22
2	62054	18	5
3	1254	19	77
4	123	20	6547
5	0	21	0

To assign a UTGID for use on a channel, the transmit code guard must be set to 0.0 or UTGID xx, where "xx" = selected talk group. (See Talk Group)

User Tx Guard

The UTXG Pick List feature allows users to choose CxCSS's from a separate (TX only) pick list containing 32 entries.

To program the UTXG Pick List with this editor, click on the Global Settings icon on the left-most panel, then select the Pick Lists tab.
Enter up to 32 Tone Guards or Digital Guards.

To assign a UTXG for use on a channel, the transmit code guard must be set to 0.0 or UTXG xx, where "xx" = selected code guard. (See Transmit Code Guard)

User Tx NAC

To program the user selectable NAC Pick List with this editor, click on the Global Settings icon on the left-most panel, then select the Pick Lists tab. Enter up to 32 Network Access Codes.

In hexadecimal mode, valid entries are $0 - $FFF. The values $F7E and $F7F are reserved for receivers and cannot be entered. To enter hexadecimal characters A - F.

In Decimal Mode, valid entries are 0000 - 4095. The values 3966 and 3967 are reserved for receivers and cannot be entered.

Label	Transmit Mode	Bandwidth
Receive Frequency	Transmit Code Guard	Low Power per Channel
Receive Mode	Transmit NAC	Security
Receive Code Guard	Squelch Operation	Key
Receive NAC	Talk Group	Key Lock
Transmit Frequency	Scan	OTAR

Zone Settings

Identification	Priority Options	Other Options

Channel Settings

Label   Transmit Mode   Bandwidth

Receive Frequency   Transmit Code Guard   Low Power per Channel

Receive Mode   Transmit NAC   Security

Receive Code Guard   Squelch Operation   Key

Receive NAC   Talk Group   Key Lock

Transmit Frequency   Scan   OTAR

Label

The radio can be programmed with a Label for each channe within a zone.
Each label can include up to thirteen characters.
Characters can include A–Z, 0–9, – , . , *, $, /, +, %, \, |, _, <, >, h, or a blank space.

Receive Frequency

Enter a valid receive frequency.

Model	Valid Frequency Range

Drag and drop the desired operations from the Available box into the Used box.

The order in which the items appear on the radio can be set by dragging and dropping the Used functions in the desired order.

Programming Options

Keypad	Programmable Zone and Channel information (frequencies, modes, etc.)*
Call List	P25 ID number and label settings.
NAC Pick List	Network Access Codes available for user selection.
TGID Pick List	Talk Groups available for user selection.
CxCSS Pick List	Code Guards available for user selection.
* Individual settings can be blocked from keypad programming access with the PC Radio Editor. (See Keypad Programming Lockouts.)	

Pick Lists Tab

Tx Code Guard   Tx NAC   Tx Talk Group

Blank	No option assigned
Channel Scan	Activate channel scan
Priority Scan	Activate priority scan
Repeater Talkaround	Transmit on programmed receive frequency
Zone Scan	Activate Zone scanning
Emergency	Activate emergency function (Digital and Mixed Mode channels only)
Backlight	Activate keypad/display lighting
Tx Power	Toggle High/Low transmit power
Monitor	Unmute audio
Tx Digital Mode	Toggle Digital/Analog transmitting (Mixed Mode channels only)
Tx Secure	Toggle between clear and encrypted transmission on channels programmed for switchable secure Tx. (See Zone settings)
Individual Call	Activate Unit-to-Unit Call mode
Zeroize Keys	Erase all encryption keys and passwords
Request Key	Request new encryption key. (OTAR enabled radios only)
PRI Chan Select	Assign new Priority 1 Channel
Picklist CxCSS	Assign Code Guard from programmed pick list
Picklist NAC	Assign Network Access Code from programmed pick list
Picklist TGID	Assign Talk Group ID from programmed pick list
Picklist Key	Assign encryption key form programmed pick list
Picklist Keyset	Assign encryption Keyset
Zone Select	Change operating Zone selection
Squ**Programming**	Adjust signal strength required to unmute audio
To allow field programming via the radio keypad, you must select from the list of programmable items. Me Activate Keypad menu	
Silent Mode	Toggle audible activity indicators

P150	136 to 174 MHz.
P400	380 to 470 MHz
P500	440 to 520 MHz
P800	700 to 900 MHz
M150	136 to 174 MHz.
M400	380 to 470 MHz
M500	440 to 520 MHz
M800	700 to 900 MHz

Entering a zero for the Receive Frequency will cause the radio's display to show INACTIVE when the channel is selected.

Receive Mode

Each channel can be programmed for Analog-only operation, Digital-only operation, or Mixed Mode (Analog and Digital) operation. Click on the box or use the spacebar to set select the desired operation.

A for Analog, **D** for Digital, or **M** for Mixed Mode.

Selecting Mixed Mode for receive allows the radio to automatically receive qualified digital and analog signals.

Receive Code Guard

Analog and Mixed Mode channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.

CTCSS
Enter the tone frequency for the channel. Enter out to a tenth of a Hertz.
(67.0 - 250.3 Hz)

CDCSS
For operation, enter a D followed by the CDCSS code number. (000 - 999)
If inverted code operation is required, follow the CDCSS code number with a minus sign.

Carrier/Noise Squelch
For carrier or noise squelch, enter 000.0 for the RX CG.

Menu Button Options

If **Menu** is assigned to a button, items in the **"Used"** box will be shown when the button is pushed. Menu functions will show on the radio's display in the order they appear in the **"Used"** box.

Arrange the order by clicking and dragging selections into the desired order.

Available Button Options

Available

Backlight
Channel Scan
Emergency
Keypad Lock
Menu
Mixed Mode TX
Monitor
Picklist-CxCSS
Picklist-KEY
Picklist-KEYSET

Drag and drop functions.

Channel Scan — Left Toggle
Priority Scan — Right Toggle
Tx Secure — Collar Switch

Unavailable Functions.

Channel Scan — Left Toggle
Pr Scan — Right Toggle
Tx Secure — Collar Switch

Assignable Switch Options

Blank	No option assigned
Channel Scan	Activate channel scan
Priority Scan	Activate priority scan
Repeater Talkaround	Transmit on programmed receive frequency
Zone Scan	Activate zone scanning
Emergency	Activate emergency function (Digital and Mixed Mode channels only)
Backlight	Activate keypad/display lighting
Tx Power	Toggle High/Low transmit power
Monitor	Unmute audio
Tx Digital Mode	Toggle Digital/Analog transmitting (Mixed Mode channels only)
Tx Secure	Toggle between clear and encrypted transmission on channels programmed for switchable secure Tx. (See Zone settings)

Button Assignments

Click and drag selections from the Available box to the desired button assignment.

ode	RX CG	RX NAC
D	000.0	$29
M	000.	$29

This setting only applies to Analog and Mixed Mode channels.

Receive NAC

Network Access Codes (NACs) provide the digital equivalent of analog sub-audible signaling (CTCSS/CDCSS) allowing a group of radios to be selectively called within a system. NACs can be viewed in decimal or hexadecimal format (a leading $ indicates HEX). Set the default viewing format in the Options Menu.

Each Digital or Mixed Mode channel is programmed with a receive NAC and a transmit NAC. When an incoming signal's NAC matches the channel's programmed receive NAC, the radio unmutes.

The digital equivalent of carrier squelch is achieved by programming the receive NAC = $F7E (3966 Decimal); the radio will unmute when a digital signal with **any NAC** is detected.

Decimal Programming

RX CG	RX NAC	Tra Fre
000.0	0659	Inac
000.0	0659	nac

Range
0 – 4095

Default
0659

3966 = Carrier or Noise Squelch

Hexadecimal Programming

Range
$0 – $FFF

Default
$293

$F7E = Carrier or Noise Squelch

This setting only applies to Digital and Mixed Mode channels.

Transmit Frequency

Enter a Valid transmit frequency. Different frequencies can be entered for receive and transmit.

Model	Valid Frequency Range
P150	136 to 174 MHz.
P400	380 to 470 MHz
P500	440 to 520 MHz
P800	700 to 900 MHz
M150	136 to 174 MHz.
M400	380 to 470 MHz
M500	440 to 520 MHz

Switch and Button Assignments

Switch Assignments

Button Assignments

Programming Menus

Switch Assignments

Click and drag selections from the Available box to the desired switch assignment.
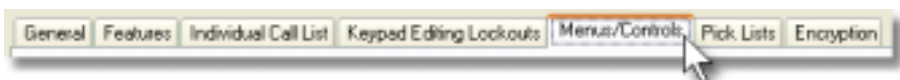
NOTE: Not all available functions are assignable to switches. (See below.)

Available Keypad Programming Options

Channel Settings	Zone Settings	Global Settings
Channel Labels	Zone Label	Global Priority 1 Channel
Rx Frequency	ANI ID	Global Priority 1 Zone
Rx Operating Mode	ANI/DTMF Operation	Global Tx on Priority 1
Rx Code Guard	Priority 1 Channel	Global Priority 2 Channel
Rx Network Access Code	Priority 2 Channel	Global Priority 2 Zone
Tx Frequency	Tx on Priority 1 On/Off	Scan Hold Time
Tx Operating Mode	Add/Delete Zone Scan List	Busy Channel Mode
Tx Code Guard		Tx Timeout Timer
Tx Network Access Code	**Pick Lists**	Backlight Mode
Squelch Operation	Code Guard Pick List	Backlight Duration
Talk Group	NAC Pick List	Battery Saver
Analog Bandwidth	Talk Group Pick List	User Password
Low Power	Key Pick List	
Secure Mode Options		
Encryption Key		

Menus & Controls Tab

| General | Features | Individual Call List | Keypad Editing Lockouts | Menus/Controls | Pick Lists | Encryption |

There are three programmable switches on the top of the KNG portable along with seven programmable buttons to offer radio users a variety of selectable functions.
To program these functions click on the Global Settings icon in the left-most panel, then select the Controls tab.

M800	700 to 900 MHz

Entering a zero for the Transmit Frequency when a valid Receive Frequency has been programmed will make the channel a Receive-Only channel (the transmitter will be locked OFF).

Note: Channels programmed with Transmit frequencies must also contain a Receive frequency.

Transmit Mode

Each channel can be programmed for Analog-only operation, Digital-only operation, or Mixed Mode (Analog and Digital) operation. Selecting Mixed Mode for transmit allows the radio to transmit both digital and analog signals. Click on the box or use the spacebar to set select the desired operation.
A for Analog, **D** for Digital, or **M** for Mixed Mode.

If the channel's Transmit Mode is programmed for Mixed, the default transmit mode is set by the Transmit Digital Mode soft switch (see Global Controls Tab for control assignment options).

Transmit Code Guard

Analog and Mixed Mode channels can use sub-audible signaling to allow one radio or a group of radios to be selectively called within a system.

CTCSS
Enter the tone frequency for the channel. Enter out to a tenth of a Hertz.(67 - 255 Hz)

Mode	TX CG	TX NAC
D	067.0	$293
A	000.0	$293
A	000.0	$293

CDCSS
For operation, enter a D followed by the CDCSS code number.(000-999)
If inverted code operation is required, follow the CDCSS code number with a minus sign.

Mode	TX CG	TX NAC
D	D131	$293
A	000.0	$293
A	000.0	$293

No Tone
To transmit an open carrirer, enter 000.0 for the TX CG.

Mode	TX CG	TX NAC
D	000.0	$293
A	000.0	$293
A	000.0	$293

User Selectable Tone
Entering 000.0 for the TX CG allows for user tone selection from the programmed pick lists. (See Pick Lists tab)

!!! WARNING!!!
Keypad lockouts can be overridden by entering keypad programming mode using the radio's Administrator Password. If you're using lockouts, be sure to set the Administrator password under the General tab.

Encryption Key Pick List

To use the radio to call a unit on the Call List, enter Unit-to-Unit mode. Use the keypad to enter the desired call list entry (0 - 100) and press PTT to place the call. To call a unit that is not on the call list, enter Unit-to-Unit mode. Press **[#]**, then enter the desired ID and press PTT to place the call.

Keypad Editing Lockouts Tab

All available keypad programmable option can be locked to disallow field programmability of proprietary functions.
Any function selected in the Keypad Editing Lockouts screen will not be available when the User Password is used to enter the programming mode.

To program Keypad Editing Lockouts, click on the Global Settings icon in the left-most panel, then select the Keypad Editing Lockouts tab.

Before enabling keypad editing lockouts see **WARNING** below.

To program a preselected Pick List tone type "U" followed by the desired tone number (1-32). The programmed tone will remain associated with the channel until a different tone is selected by the user. When reading a radio, channels with active user selected tones will show "UTXG" followed by the current tone number.

Transmit NAC

This setting only applies to Digital and Mixed Mode channels.

Network Access Codes (NACs) provide the digital equivalent of analog sub-audible signaling (CTCSS/CDCSS) allowing a group of radios to be selectively called within a system. NACs can be viewed in decimal or hexadecimal format (a leading $ indicates HEX). Set the default viewing format in the Options Menu. Each Digital or Mixed Mode channel is programmed with a receive NAC and a transmit NAC. When an incoming signal's NAC matches the channel's programmed receive NAC, the radio unmutes.

Decimal

Range
0 – 4095

Default
0659

3966 = Not Allowed

Hexadecimal

Range
$0 – $FFF

Default
$293

$F7E = Not Allowed

The default NAC is $293 (0659 Decimal).
The $F7E NAC is reserved for receivers and is not allowed as a transmit NAC.

Enabling User Selectable NAC
Entering "U, zero" for the TX NAC allows for user TX NAC selection from the programmed pick lists. (See Pick Lists tab)
The TX NAC box will show UNAC EN.

When a NAC of zero is selected by the user, the TX NAC defaults to $293 (0659 decimal).

If checked, after receiving a Unit-to-Unit call pressing the PTT while the Scan Hold Time remains causes the radio to responded with a Unit-to-Unit Call to the received signal. (See Unit-to-Unit Calls)
If unchecked, Unit-to-Unit Call Mode must be initiated via the keypad. (See Controls tab)

Enable Per-Channel Low Power Select
If checked, the radio will transmit in only in low power on channels programmed to Low Power.
If unchecked, transmit power is selectable.

Use Non-Carrier Busy Channel Test
If checked, it does something.
If unchecked, it does something else.

Honor NAC During Busy Channel Test
If checked, it does something.
If unchecked, it does something else.

Transmit On NAC Mismatch
If checked, it does something.
If unchecked, it does something else.

Ignore Rx=Tx Freq. For Tx Status
If checked, it does something.
If unchecked, it does something else.

Individual Call List Tab

P25 Unit IDs allow for Unit-To-Unit calls when the radio is operating in Digital Mode. If the calling unit's ID is on the Call List, the radio will display its label along with the phone icon, otherwise the numeric ID will be displayed along with the phone and ID icon. If a label is displayed, press and hold **[#]** to view the corresponding numeric ID.

On the Global Settings screen, click on the Individual Call List tab. Enter up to ten 12-character labels (some radio models will only display the first 8 characters). Enter up to ten 7-digit unit IDs (0 – 9999999).

Enable Emergency Mode Automatic Transmit
If checked and Emergency Mode is enabled (see Controls tab), the radio will begin transmitting the emergency signal when the Emergency Mode is activated.
If unchecked and Emergency Mode is enabled, after the Emergency Mode is activated the Push-to-Talk button must be pressed to transmit the emergency signal .

Enable Talkback Scan
If checked, pressing PTT while a scanned channel is active or while Scan Hold Time remains causes the radio to transmit on the frequency of the received channel.
If unchecked, the radio will transmit on the frequency of the channel selected by the channel select knob. Or if Priority Scan is enabled and Transmit on Priority 1 is selected, pressing the PTT will transmit on the programmed Priority 1 channel. (See Priority Settings)

Enable Mixed-Mode Talkback
Channels programmed to receive Mixed Mode will receive both digital and analog transmissions exhibiting the proper signaling (NAC, Talk Group, etc.).
If checked, pressing the PTT while the "RX" indictor is visible on the LCD display will cause the radio to transmit in the same mode, analog or digital, as the received transmission.
If unchecked, the radio will transmit in the channels programmed mode.

Enable Unit-to-Unit Callback

To program a preselected Pick List tone type "U" followed by the desired tone number (1-32). The programmed tone will remain associated with the channel until a different tone is selected by the user. When reading a radio, channels with active user selected tones will show "UTXG" followed by the current tone number.

Squelch Operation

For Digital and Mixed Mode channels, a digital squelch operation must be programmed.

Click on the box or use the space bar to set select the desired operation.

Normal
Used to mimic analog operation. Signals are only qualified with the programmed receive Network Access Code (NAC). All Talk Group IDs (TGIDs) and P25 Unit IDs are accepted.

Selective
Used for processing 'Group Calls' and 'Unit-to-Unit Calls'. Users can be separated into Talk Groups with each group having its own TGID. Then, on channels programmed for Selective squelch, the incoming signal's NAC and TGID must match the channel's programmed receive NAC and TGID for the radio to unmute. Incoming Unit-to-Unit calls must match the channel's programmed receive NAC and the unit's P25 Unit ID to be received.

Talk Group

This setting applies to Digital and Mixed Mode channels only.

Network Access Codes (NACs) provide the digital equivalent of analog sub-audible signaling (CTCSS/CDCSS) allowing a group of radios to be

selectively called within a system. Users in the same area (using the same NAC) can be further divided into Talk Groups, with each group having its own Talk Group ID (TGID). 'Group Calls' are made by designating both the users' NAC and TGID.

Enter a value between 0 and 65535. The default TGID is 1.

SQ Op	Tlk Grp	Scn
Select	65535	-
Select	1	-
Select	1	-

Special Talkgroup Settings

65535 "All Call"
65535 is used to effect an "All Call".
If the radio receives an incoming signal with a matching NAC and the TGID = 65535, it will ignore its programmed TGID and unmute.
If the radio's programmed TGID is 65535, it will open on any signal with a matching NAC, ignoring the incoming TGID.

0 "No One"
If the radio is programmed with the TGID = 0, it will only accept incoming group calls with matching NACs containing the "All Call" TGID, and correctly addressed Unit-to-Unit calls.

User Selectable Talk Group
Entering "U, zero" in the Tlk Grp box allows for user Talk Group selection from the programmed pick lists. (See Pick Lists tab)
The TGID NAC box will show UNAC EN.

Q	Tlk Grp	Scn
lect	UTGID EN	S
lect	1	-

When a NAC of zero is selected by the user, the TX NAC defaults to $293

Enable Nuisance Channel Delete
If checked and Channel Scan is assigned to a top switch, a Nuisance Channel can be temporarily removed from the Scan List by sliding the switch down momentarily and then back up. When the radio is powered down and then back on, the channel will be restored to the scan list.
If unchecked, unwanted scan channels must be removed via keypad or PC programming.

Digital Squelch Mode Offhook
If checked, when in monitor mode, channels assigned to operate in Digital mode unmute only when a digital signal with matching NAC is received.
Mixed Mode channels will unmute when an analog signal is detected regardless of the assigned tone (CTCSS/CDCSS) or when a digital signal with matching NAC is received.
If unchecked, all detected digital and analog activity will unmute the radio regardless of NAC or tone.

Disable Beeps
If checked, all audible activity tone indicators will be muted.
If unchecked, the radio will emit audible indications of radio activities such as power-up tone, keypress tones, etc.

Priority Scan Period (sec)
Use the selection box to program the rate at which the Priority Channels are sampled when the radio is operating in Priority Scan Mode.
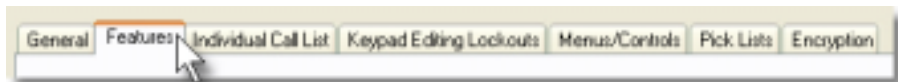**NOTE:** A sampling rate of at least 0.50 seconds is recommended when operating in Digital Mode.

Transmit Features

NOTE: All Talkback/Callback hold times are equal to the Scan Hold Time.

Features Tab

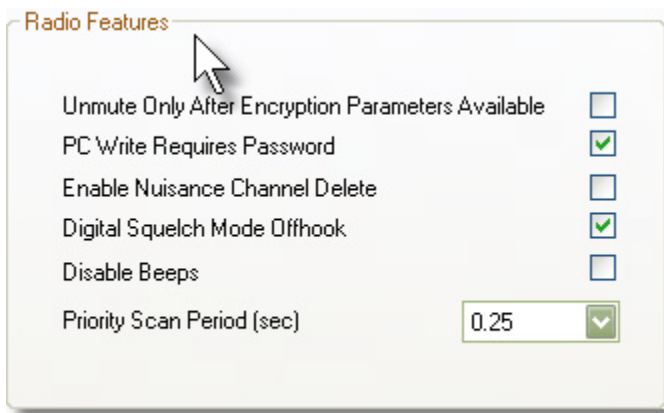The Features Tab consists of data used to enable or disable specific operational features.
To access the Features Data, click on Global Settings in the leftmost panel, then on the Features tab.

General | Features | Individual Call List | Keypad Editing Lockouts | Menus/Controls | Pick Lists | Encryption

[Radio Features](#)   [Transmit Features](#)

Radio Features

Radio Features

Unmute Only After Encryption Parameters Available	☐
PC Write Requires Password	☑
Enable Nuisance Channel Delete	☐
Digital Squelch Mode Offhook	☑
Disable Beeps	☐
Priority Scan Period (sec)	0.25

Unmute Only After Encryption Parameters Available
If checked, encrypted channels unmute only when receiving encrypted signals matching the encryption key assigned to the channel.
If unchecked, encrypted channels will unmute when receiving signals matching any encryption key written to the radio regardless of SLN assignment.
(See Encryption)

PC Write Requires Password
If checked, programmers will be prompted to enter the radio's Administrator Password before writing to the radio via computer.
If unchecked, a password is not required to write information to the radio.

(0659 decimal).

To program a preselected Pick List tone type "U" followed by the desired tone number (1-32). The programmed tone will remain associated with the channel until a different tone is selected by the user. When reading a radio, channels with active user selected tones will show "UTXG" followed by the current tone number.

Scan

Place an S in the vertical Scan List column next to the channel(s) to be scanned when the radio is operating in Scan Mode.

Click on the box or use the spacebar to select "S" for channels to be scanned or "-" for channels not to be scanned.

Tlk Grp	Scn	BW	LF
65535	S	-	L
1	-	-	L
1	-	-	L

Bandwidth

For Analog channels, place an" N" in the vertical Bandwidth column next to the channel(s) for which you want the radio to operate on a 12.5 kHz band channel with 2.5 kHz max deviation. Channels marked with a "–" will operate on a 25 kHz band channel with 5 kHz max deviation.
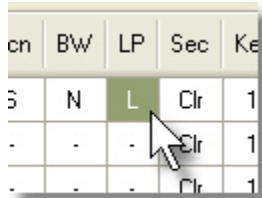
Click on the box or use the spacebar to select "N" for Narrow Band operation or "-" for Wide Band Operation.

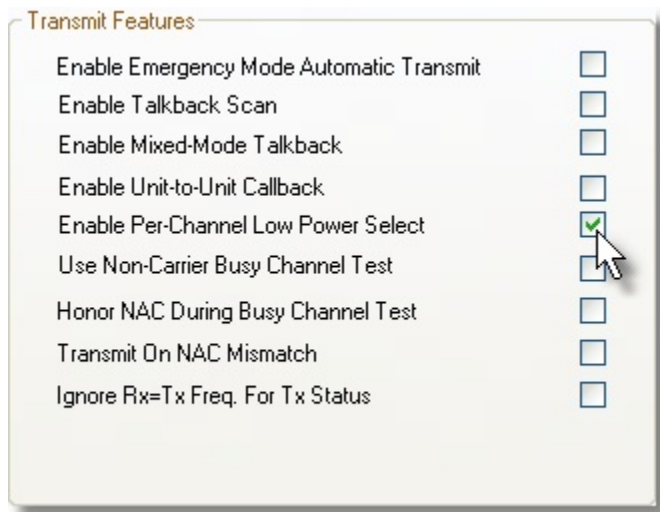|	Scn	BW	LP	Se
35	S	N	L	CI
	-	-	L	CI
	-	-	L	CI

NOTE: Digital channels always operate in Narrow Band Mode.

Low Power per Channel

Click on the box or use the spacebar to select "L" to lock channel in Low power or "-" to allow use of the Hi/Lo power switch. (See the Global Controls screen for switch options.)

Note: Per Channel Power Selection must be enabled on the Global Settings Features screen for the Low Power list to be recognized by the radio.
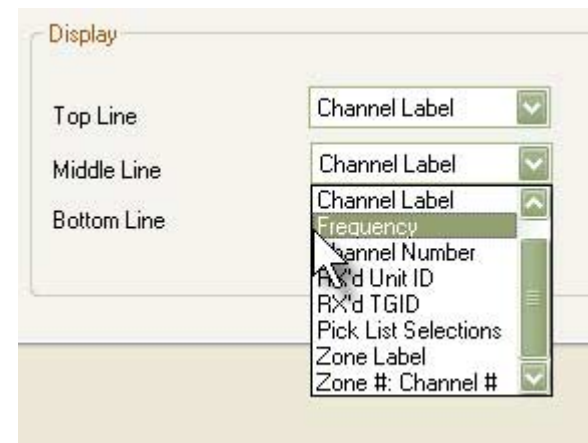

Security

The following applies only to radios equipped with the Cryptographic module.

Display

Use the dropboxes to select the information to be shown in the radio LCD screen.

Display Options

Any of the three displayed lines can be programmed to display:

Nothing

Channel Label

Channel Frequency

Channel Number

Received Unit ID

Received Unit Talk Group ID

Pick List Selections

condition. If the Channel Selector is changed, the Emergency Mode will follow to the newly selected channel. Cycle power to return the radio to normal operation.
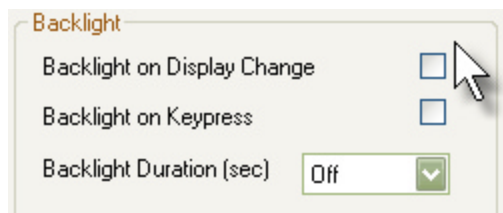
Automatic Emergency Transmit
See Features to select this Emergency operation function.
If the "Enable Emergency Mode Automatic Transmit" box is selected in the Global Features screen, The radio transmits immediately upon entering the Emergency mode.

NOTE: On channels programmed for analog transmissions, and channels programmed for Mixed Mode transmissions with the 'TX Digital" switch OFF, pressing PTT in Emergency Mode will result in a normal analog transmission.

Backlight Settings

To program display/keypad lighting, click on the Global Settings icon in the left-most panel, then select the General tab.

Backlight on Display Change
If checked the display/keypad will illuminate anytime displayed information or indicators change.
Display changes include Channel knob or PTT activity and Tx, Rx and Scan indicators.

Backlight on Keypress
If checked the display/keypad will illuminate anytime a button is pushed

Backlight Duration
Select the desired time for the display to illuminate.(1 to 6 seconds, always On/Off)
The Backlight Duration must be programmed to a setting other than OFF before the display will illuminate.

Digital channels can be programmed to always transmit encrypted (Enc), always transmit clear (Clr), or to select the Transmit Mode with the Transmit Secure switch (Sw). Analog channels and channels that are locked clear or encrypted, will ignore the Transmit Secure switch.

Click on the box or use the spacebar to select "Clr" for clear transmissions only, "Enc" for encrypted transmissions only or "Sw" to switch between encrypted and clear with the "Tx Secure" switch. (See the Global Controls screen for switch options.)

Key

The following applies only to radios equipped with the Cryptographic module.

The radio can hold up to 32 DES and/or AES encryption keys.

For transmit, each channel is assigned a default key. The key can be locked to the channel, or if programming allows, a transmit key other than the default key can be selected from the radio's Key Pick List (see Global Encryption screen for options).

NOTE: If a key is selected from the pick list during radio operation, it will be used during transmit on every channel that allows selectable keys.

Click on the box to set the default transmit key number (1 - 32) for each channel.
This setting will be ignored by analog channels and channels programmed to always transmit in clear mode.

Receiving Encrypted Signals
The receiver automatically detects both clear signals and signals encrypted with any of the programmed keys.

Key Lock

The following applies only to radios equipped with the Cryptographic module.

For transmit, each channel is assigned a default key. The key can be locked to the channel, or if programming allows, a transmit key other than the default key can be selected from the radio's Key Pick List (see Global Encryption screen for options).

Click on the box or use the spacebar to select "L" to lock the key to the channel or "-" to allow use of the Encryption Key Pick List.

OTAR

The following applies only to radios equipped with the OTAR option.

Radios that have the factory option support Over-the-Air Rekeying of encryption keys (OTAR). This programming software must be used to Enable OTAR and to mark the channel(s) that will communicate with the Key Management Facility (KMF). In addition, the radio must have key encryption

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ANI burst being transmitted.

To program the ANI Front Porch Time, click on the Global Settings icon in the left-most panel, then select the General tab.

Emergency Tx

To program the radio for Emergency operation, click on Global Settings in the left-most panel, and select the Global Data tab.
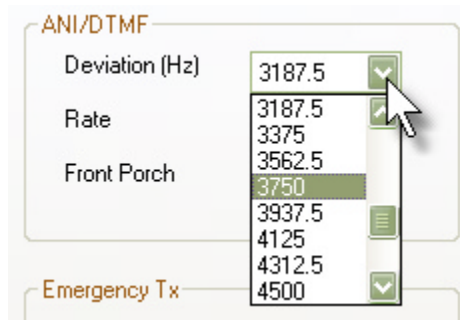
When Emergency Mode is activated, each transmission will contain a bit in the data stream indicating an emergency condition as defined in the APCO Project 25 standards.

Standard Emergency Operation
Emergency operation only applies to channels programmed for Digital or Mixed Mode transmissions. If the channel is programmed for Mixed Mode transmissions, the 'TX Digital' switch must be ON. To place an emergency group call, press and hold the emergency button (as assigned in the Controls section) until the radio beeps and the display flashes. All scanning and priority scanning functions will be disabled. If the radio is in Unit-To-Unit Mode, that mode will be exited and the radio will be placed in Emergency Mode. Each subsequent press of PTT will cause the radio to transmit on the knob-selected channel with the emergency bit set, indicating an emergency

most panel, then select the General tab.

Select the deviation (0 – 4875 Hz) to be used when the radio is operating in Wide Band Mode (25 kHz channels). This setting will automatically be halved when the radio is operating in Narrow Band Mode (12.5 kHz channels).
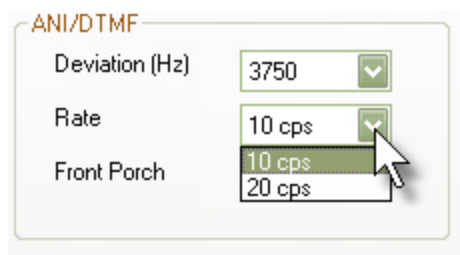

ANI Rate

ANI encoding (Automatic Numeric Identification), if enabled, transmits a sequence of DTMF tones each time you press the PTT switch.

To program the rate at which the DTMF tones are transmitted, click on the Global Settings icon in the left-most panel, then select the Global Data tab.

Select 10 or 20 characters per second.

Front Porch Time

ANI encoding (Automatic Numeric Identification), if enabled, transmits a sequence of DTMF tones (ANI ID) each time you press the PTT switch. The Front Porch Time is the time between the PTT being pressed and the DTMF

keys (used only to encrypt other keys) loaded with an APCO Project 25 compatible key fill device such as the Motorola KVL 3000 Plus, using a BK Radio keyloader cable.

Use the dropbox to select "O" for channels that will receive OTAR messages, or "-" to disable OTAR on the channel.

OTAR must be enabled in the Global Encryption screen.

When the radio is operating in Channel Scan, Priority Scan, and Zone Scan, the main zone's OTAR Scan Option Channel is used for the OTAR channel. If the OTAR Scan Option Channel is set to "None", OTAR will be disabled when any scan mode is enabled.
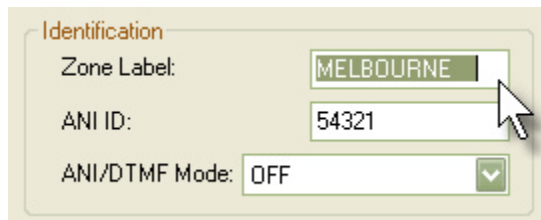
Zone Settings

[Identification](#)   [Priority Options](#)   [Other Options](#)

Identification

Zone Label

The radio can be programmed with a label for each of channel zone. Each label can include up to twelve characters.
Characters can include A–Z, 0–9, – , . , *, $, /, +, %, \, |, _, <, >, h, or a blank space.

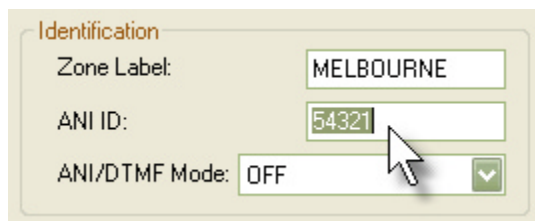### Automatic Number Identification

On each Zone Settings screen, enter up to 7 digits (0 – 9, A – F) for the ANI ID that will be used when the zone is selected. The Automatic Numeric Identification (ANI) ID number can be used for radio management or transmitted as a DTMF tone burst for ANI purposes.
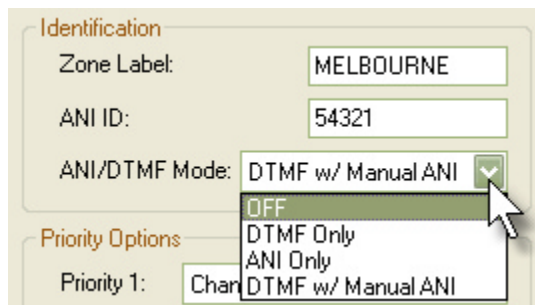

ANI/DTMF Operation
This feature is only available when the radio is operating in Analog Mode.

On each Zone Settings screen, the ANI/DTMF Mode for the zone can be programmed. (See the Global General tab to set operational characteristics.)

When receiving activity on a scanned channel the radio will continue monitoring for activity on the assigned priority channels.
When activity is detected the radio switches to receive the priority channel.

Disabled
If checked Priority Channel 2 operation is disabled
If unchecked priority scan operation is determined by the Global Priority settings.

Use Main Channel
If checked the Priority 2 channel is selected by the channel select knob.
If unchecked the Priority 2 channel is assigned via the Pri Zone and Channel selections. (See below)

Pri 2 Zone/Pri 2 Chan
Select the zone and channel of the desired Global Priority Channel 1.

ANI/DTMF

DTMF Deviation

ANI Rate

Front Porch Time

DTMF Deviation

To program DTMF Deviation, click on the Global Settings icon in the left-

Priority 1

When selected as Global Priority 1 the assigned channel takes priority over all other channels when operating in the priority scan mode. When receiving activity on a scanned channel the radio will continue monitoring for activity on the assigned priority channels. When activity is detected the radio switches to receive the priority channel.

Disabled
If checked Priority channels are selected as assigned in the radio's currently selected Channel Zone. (See priority options under Channel Zones)
If unchecked priority scan operation is determined by the Global Priority settings.

Use Main Channel
If checked the Priority 1 channel is selected by the channel select knob.
If unchecked the Priority 1 channel is assigned via the Pri Zone and Channel selections. (See below)

Pri 1 Zone/Pri 1 Chan
Select the Zone and channel of the desired Global Priority Channel 1.

Priority 2

When selected as Global Priority 2 the assigned channel takes priority over all other channels, except Global Priority 1 channel, when operating in the priority scan mode.

OFF
Keypad is disabled for DTMF. ANI is not transmitted with each PTT press.

DTMF Only
Keypad-equipped radios can be programmed to enable DTMF (Dual Tone Multiple Frequency) encoding when operating in analog mode. To send DTMF tones (similar to the tones used by a standard push-button telephone), press and hold the PTT switch, then press any of the keys on the keypad. You will hear a sidetone. The [FCN], [PRI], [ENT], and [CLR] keys respond as DTMF tones A, B, C, and D, respectively.

ANI Only
ANI encoding (Automatic Numeric Identification), if enabled, transmits a sequence of DTMF tones each time you press the PTT switch when operating in analog mode. The tone sequence is determined by the number entered in the ANI ID field. You will hear a sidetone. See also ANI Rate.
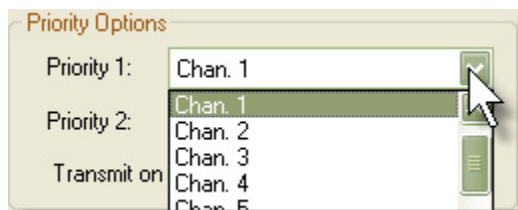
DTMF w/Manual ANI
If DTMF and ANI are both enabled, the ANI tone sequence is transmitted only after the [ENT] key is pressed while the PTT switch is activated when operating in analog mode. You will hear a sidetone.
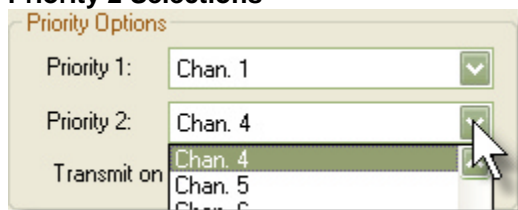
Priority Options

In each zone, up to two channels can be designated as priority channels. In Priority Scan mode, these two, PR1 and PR2, are periodically checked for activity, even if a different channel is being listened to. Activity on PR2 preempts activity on any of the non-priority channels. Activity on PR1 has priority over any other channel in the zone, including PR2. Priority Scan is automatically disabled when Zone Scan is on.

Use the drop box to assign the Priority 1 and Priority 2 channels. Priority operation can be disabled by selecting "Off".
When "Use Main Channel" is selected the Priority channel will be the currently selected operating channel.
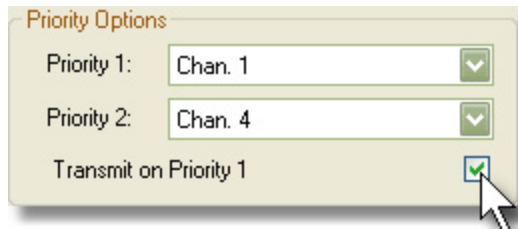
Priority 1 Selection

Priority 2 Selections

Priority Transmissions
If the radio is programmed to Transmit on Priority 1, transmissions will occur on PR1 when operating in Priority Scan Mode.

Other Options

Zone Scan List
If programmed the KNG can scan across selected zones. (See the Global Controls screen to enable Zone Scan.)
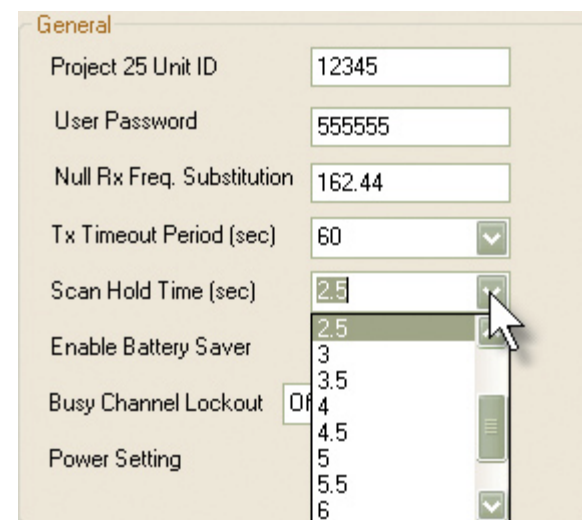Use the dropbox to add the current Zone to the Zone Scanning List

NOTE: The power level associated with the Medium Power selection is set via radio tuning. Radio tuning should only be performed by a qualified service technician.

Scan Hold Time

The Scan Hold Time allows the user to hear responses to calls before the radio resumes scanning. It also allows time for the user to respond to a call when Talkback Scan, Mixed Mode Talkback, or Unit-to-Unit Callback is enabled.

To program Scan Hold Time, click on the Global Settings icon in the left-most panel, then select the General tab.

Global Priority

Priority 1

Priority 2

position. If the radio detects an incorrect value or carrier activity only, the transmitter is disabled. If an attempt is made to transmit, an alert tone will be generated and the display will show the word BUSY until the channel becomes available or the PTT switch is released, whether the Squelch knob is in or out of the Channel Guard detent. Channels not programmed with a receive Channel Guard value can be used to transmit regardless of carrier activity.

Lockout with Override
This mode operates in the same manner as Busy Channel Lockout except that the user can override and transmit by turning the Squelch knob off the Channel Guard detent. The transmitter is locked out only if the Squelch knob is set to the Channel Guard detent.

Power setting

The power output associated with the Hi selection of the Hi/Lo power switch can be set in the global settings.

Select High or Medium power selection to set transmit power output when "Hi" is selected via the switch. (See the Global Controls screen for switch options.)

Incoming Clone
Each zone can be blocked from receiving clone information from a master radio.
Use the dropbox to allow or reject incoming cloning.

3 Global Settings

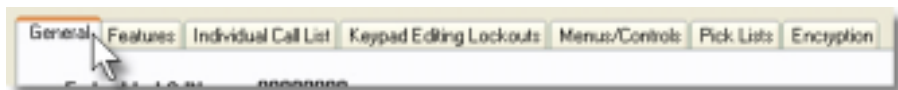General Settings   Menus and Controls

Features   Pick Lists

Individual Call List   Encryption

Keypad Programming Lockouts

General Tab

The General Tab consists of data used by ALL Channel Zones in the radio, such as the radio's P25 Unit ID, User Password, Priority Channel settings, etc. To access the General Data, click on Global Settings in the leftmost panel, then on the General tab.

General | Features | Individual Call List | Keypad Editing Lockouts | Menus/Controls | Pick Lists | Encryption

General Settings   Global Priority   ANI/DTMF

Emergency Tx   Backlight Settings   Display Settings

General Settings

Embedded Serial Number   TX Timeout-Timer

P25 Unit ID   Battery Saver

User Password   Busy Channel Mode

Administrator Password   Power Setting

Null Frequency Substitution   Scan Hold Time

Embedded Serial Number

Each radio is programmed in the factory with a unique serial number that cannot be modified in the field. This number is displayed on the General Settings screen, and also appears after the model number on the radio's FCC label.

To view the radio's Embedded Serial Number, click on the Global Settings icon in the left-most panel, then click on the General tab.

Embedded S/N   0801001

General
Project 25 Unit ID   1
User Password   000000
Administrator Password   000000
Null Rx Freq. Substitution   0.0000
Tx Timeout Period (sec)   125
Scan Hold Time (sec)   2
Enable Battery Saver   ☑
Busy Channel Lockout   Indicate
    Off
    Indicate
    Lock w/ override
Power Setting   Lockout

Select from the following modes:

OFF
No indication of channel activity.

Indicate
The yellow Busy Channel Indicator on the top of the radio glows if there is carrier activity on the selected channel. If the selected channel is a Channel Guard channel and the proper Channel Guard value is not detected, the Busy Channel Indicator remains on for the duration of the carrier activity and no message is heard. During Scan and Priority Scan operation, the Busy Channel Indicator glows when activity is detected on any channel on the Scan List. When scanning or priority scanning Channel Guard channels with the Squelch knob in the Channel Guard position and activity has been detected, the Busy Channel Indicator glows for the time period necessary to determine if the proper Channel Guard value has been received. This will cause the Busy Channel Indicator to flash at various rates.

Lockout
The Busy Channel Lockout feature applies only to those channels programmed with a receive Channel Guard value. When carrier activity is detected on the channel selected, the radio checks the receive Channel Guard value. If the proper Channel Guard value is present, the radio can transmit on that channel, even if the Squelch knob is in the Channel Guard

NOTES:
The battery saver should be turned off only for getting proper voltage readings during service or for systems requiring fast squelch attack time.

BK Radio current drain and battery life specifications are based on performance with the battery saver on.

Busy Channel Mode

The Busy Channel feature indicates activity on a channel.

To program Busy Channel Mode, click on the Global Settings icon in the left-most panel, then select the General tab.

P25 Unit ID

To program the radio's P25 Unit ID, click on the Global Settings icon in the left-most panel, then select the **General** tab. Enter a number between 0 and 9999999.

P25 Unit IDs allow for Unit-To-Unit calls when the radio is operating in Digital Mode.

Channels programmed for analog only operation will not be able to transmit or receive Unit-To-Unit calls.

When the radio is operating in Unit-To-Unit Mode, all scanning functions will be disabled. The radio will receive and transmit on the Ready-to-Transmit (RTX) channel only. Depending on programming, the RTX channel can be the main channel, a held scan or priority channel if Talkback Scan is enabled, or the Priority 1 channel if TX on PR1 is enabled. To alert the user that the radio is in Unit-To-Unit Mode, a beep will periodically sound until the unit is returned to normal Operating Mode.

User Password

Enter the 6-digit User Password that is required to enter Keypad Programming Mode.

Providing the correct User Password allows programming access to any fields not locked by the Keypad Editing Lockouts selections in the Keypad Programming Lockouts screen screen.

!!! WARNING !!!
Using the radio's Administrator Password, which is set in the box directly below the User Password box, overrides the Keypad Editing Lockout selections and allows keypad programming of all available functions. To use the keypad editing lockout options the User and Administrator passwords must be set to different values.

Available Keypad Programming Options

Battery Saver

To program the radio for Battery Saver operation, click on the Global Settings icon in the left-most panel, then select the General tab.

Check the box to enable the battery saver.

TX Timeout-Timer

The Transmit Time-Out-Timer limits the duration of calls and guards against accidentally locking on the transmitter and tying up the radio system. The timer can be turned OFF, or set for a duration of 15 – 225 seconds in 15 second incements.

To program Tx Timeout Timer, click on the Global Settings icon in the left-most panel, then select the General tab.

Channel Settings	Zone Settings	Global Settings
Channel Labels	Zone Label	Global Priority 1 Channel
Rx Frequency	ANI ID	Global Priority 1 Zone
Rx Operating Mode	ANI/DTMF Operation	Global Tx on Priority 1
Rx Code Guard	Priority 1 Channel	Global Priority 2 Channel
Rx Network Access Code	Priority 2 Channel	Global Priority 2 Zone
Tx Frequency	Tx on Priority 1 On/Off	Scan Hold Time
Tx Operating Mode	Add/Delete zone Scan List	Busy Channel Mode
Tx Code Guard		Tx Timeout Timer
Tx Network Access Code		Backlight Mode
Squelch Operation		Backlight Duration
Talk Group		Battery Saver
Analog Bandwidth		User Password
Low Power		Code Guard Pick List
Secure Mode Options		NAC Pick List
Encryption Key		Talk Group Pick List
Over the air Re-Keying		Encryption Key Pick List

Administrator Password

Enter the 6-digit Administrator Password to enter Touchpad Programming Mode.

Providing the correct Administrator Password allows programming access to *all* keypad programming fields.

Using the Administrator Password to enter keypad programming mode overrides the the Keypad Editing Lockout selections and allows allows programming of all keypad programmable functions.

Using the User Password to enter keypad programming will disallow programming of functions locked by the Keypad Editing Lockouts selections in the Global Settings screen.

The Administrator Password will also be required to write information to the radio if selected in the Global Features screen.

Available Keypad Programming Options

Channel Settings	Zone Settings	Global Settings
Channel Labels	Zone Label	Global Priority 1 Channel
Rx Frequency	ANI ID	Global Priority 1 Zone
Rx Operating Mode	ANI/DTMF Operation	Global Tx on Priority 1
Rx Code Guard	Priority 1 Channel	Global Priority 2 Channel
Rx Network Access Code	Priority 2 Channel	Global Priority 2 Zone
Tx Frequency	Tx on Priority 1 On/Off	Scan Hold Time
Tx Operating Modei	Add/Delete Zone Scan List	Busy Channel Mode
Tx Code Guard		Tx Timeout Timer
Tx Network Access Code		Backlight Mode
Squelch Operation		Backlight Duration
Talk Group		Battery Saver
Analog Bandwidth		User Password
Low Power		Code Guard Pick List
Secure Mode Options		NAC Pick List
Encryption Key		Talk Group Pick List
Over the air Re-Keying		Encryption Key Pick Lst

Null Frequency Substitution

Legacy BK Radio units (L Series, E Series, and G Series) do not support zeroed receive frequencies. However, KNG radios allow for unprogrammed channels. If you plan to clone a radio containing unprogrammed channels to a legacy radio, you should provide a frequency that will be substituted for null receive frequencies during the cloning operation.

To program the Null Frequency click on the Global Settings icon in the left-most panel, then select the General tab.